Collision-induced hyper-Rayleigh light scattering in gaseous dihydrogen-neon mixtures

Titre	Collision-induced hyper-Rayleigh light scattering in gaseous dihydrogen-neon mixtures
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Auteur	Głaz, Waldemar [1], Godet, Jean-Luc [2], Haskopoulos, Anastasios [3], Bancewicz, Tadeusz [4], Maroulis, George [5]
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Résumé en anglais	Cartesian components of the collision-induced (CI) hyperpolarizability Δβ tensor are computed for the linear, T-shaped, and 45◦ configurations of the H2-Ne pair in the intermolecular range 3 to 14 bohr. Symmetry-adapted components Δβ(K)λ L(R) of the vector (K=1) part, as well as the septor (K=3) part, of the H2-Ne CI hyperpolarizability are calculated starting from the ab initio Cartesian hyperpolarizability tensor values transformed into their spherical counterparts. By applying these quantities, the vector together with the septor collision-induced hyper-Rayleigh (CIHR) spectra for the H2-Ne binary gas mixture are determined in the frequency range from −1250 to 2500 cm−1. The profiles are partially employed as a benchmarking device to estimate the importance of the short intermolecular distance part of the Δβ(R) dependence. The depolarization ratio of the CIHR spectra in the whole frequency range is also calculated. The nature of the CIHR signal and the feasibility of the related experiments are discussed and analyzed.
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